Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-18 (Canceled)

19. (Previously Amended) A method of determining the presence of one or more target analytes in one or more samples comprising:

a) adding said one or more samples to a first substrate comprising a plurality of assay locations, such that said one or more samples is contained at a plurality of said assay locations;

b) contacting said one or more samples with a second substrate comprising:

i) a plurality of array locations, each array location comprising a plurality of discrete sites, wherein at least one assay location is in fluid contact with at least one array location; and

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein said microspheres are distributed on at least one of said array locations such that said discrete sites each contain no more than one microsphere; and

c) determining the presence or absence of said target analyte.

20. (Currently Amended) A method according to claim [[18]] 19 or 36, wherein each of said assay locations comprises a library of bioactive agents.

21. (Canceled)

22. (Currently Amended) A method according to claim [[18]] 19 or 36, wherein each discrete site is a bead well.

23-24. (Canceled)

25. (Currently Amended) A method according to claim 19 or 36, wherein said first substrate is a microtiter plate.

26. (Currently Amended) A method according to claim 19 or [[25]] 36, wherein said second substrate comprises a plurality of fiber optic bundles comprising a plurality of individual fibers, each bundle comprising an array location, and each individual fiber comprising a bead well.

27. (Currently Amended) A method according to claim 19 or 36, wherein each of said subpopulations further comprise an optical signature capable of identifying said bioactive agent.

28. (Currently Amended) A method according to claim 19 or 36, wherein each of said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand such that the identification of the bioactive agent can be elucidated.

29. (Currently Amended) A method according to claim ~~18 or~~ 19 or 36, wherein at least one of said target analytes is a nucleic acid.

30. (Currently Amended) A method according to claim ~~18 or~~ 19 or 36, wherein said microspheres are randomly distributed on said surface.

31. (Currently Amended) A method according to claim ~~18 or~~ 19 or 36, wherein at least a first subpopulation of microspheres comprises a bioactive agent comprising nucleic acids.

32. (Currently Amended) A method according to claim ~~18 or~~ 19 or 36, wherein at least a first subpopulation of microspheres comprises a bioactive agent comprising a protein.

33. (Previously presented) A method according to claim 20, wherein at least a first and second of said assay locations comprise the same library of bioactive agents.

34. (Previously presented) A method according to claim 20, wherein at least a first and second of said assay locations comprise different libraries of bioactive agents.

35. (Canceled)

36. (Previously presented) A method of determining the presence of one or more target analytes in one or more samples comprising:

a) adding said one or more samples to a first substrate comprising a plurality of assay locations, such that said one or more samples is contained at a plurality of said assay locations;

b) contacting said one or more samples with a second substrate comprising:

i) a composite array comprising a plurality of array locations, each array location comprising a plurality of discrete sites, wherein at least one assay location is in fluid contact with at least one array location; and

ii) a population of microspheres comprising at least a first and a second subpopulation each comprising a bioactive agent, wherein said microspheres are distributed on said surface such that said discrete sites each contain no more than one microsphere; and

c) determining the presence or absence of said target analyte.